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10/579,885

05/18/2006

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EXAMINER

BASKIN, JEREMY S

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/579,885	<b>Applicant(s)</b> STARK ET AL.	
	<b>Examiner</b> Jeremy S. Baskin	<b>Art Unit</b> 3753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 16, 18, 19 and 21-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16, 18, 19 and 21-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 35 is objected to because of the following informalities: In line 2, the recitation of "so that and the" should probably read "so that the". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 29 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 29 depends upon Claim 16 where it is recited, in lines 11 and 12, that the valve cone is welded to both the valve disk and valve stem. Since the instantly claimed valve cone now forms an immovable connection between the valve disk and valve stem, it would be unreasonable to conclude that the valve cone is free from forces that act on the underside of the valve disk since any flexure of the valve disk would necessarily create a flexure on the valve cone.

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4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 18, 19, and 21-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims depend upon cancelled Claim 17. The claims have been examined on the merits with Claims 18, 19, 21, 22, and 26-28 being dependent upon independent Claim 16.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 16, 18, 19, 21-24 and 29-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taub (1,727,621) in view of Topham et al. (5,044,604).

8. In regard to Claims 16, 18, 19, 21-24, 30, 33, and 34, Taub teaches a lightweight valve (Figure 4) for internal combustion engines (page 1, lines 1-3) possessing a valve stem 60, a hollow valve cone 68, and a valve disk 62. The valve cone has a region of greater diameter at 70. The valve cone and valve disk together form a hollow space 80 and the valve disk is provided with a gripping receiver 60. The valve disk has a recess defined by an edge step 64 which forms an edge region at 70 for supporting the region of greater diameter 70 of the valve cone. Since the valve stem is directly connected to the valve disk, the valve cone is virtually free from forces acting on the valve disk during operation of the lightweight valve. In the embodiment of Figure

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4, the valve stem and valve disk are integrally formed, therefore an end of an end portion of the valve stem contacts a top portion of the valve disk at 62. This claim is identified as having product-by-process subject matter i.e. welding the valve cone to the valve disk and valve stem. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See MPEP 2113 [R-1].

Taub fails to specifically teach where the gripping receiver grips an end portion of the valve stem and is formed by a plurality of reinforcing ribs on the valve disk. Taub fails to further teach where each of the reinforcing ribs includes an end face facing a center of the valve disk center so as to form a wall portion which grips an outer circumference of the valve stem.

Topham discloses a valve head and stem. In Figures 3-6, Topham teaches where a plurality of reinforcing ribs 25 are disposed on a valve disk 14 and extend radially outward from the valve stem, or central axis, to a circumference of the valve disk. In Figure 5, three of the reinforcing ribs are arranged at a spacing of 120 degrees from one another. In the right half of the sectional view of Figure 6, an end face (corresponding to 24 on the left half of the sectional view) of the reinforcing ribs faces the center of the valve disk and forms a wall of the gripping receiver. The end face grips the valve stem via a non-positive notched portion 11 and tactile knurling 10. The reinforcing ribs are rectilinear strips that have a height at 20 that increases linearly from the edge of the disk and is adjoined by a second reinforcing rib portion of constant height at 7 and an end portion of the stem 6 contacts a top portion of the valve disk 14 in Figure 6.

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At the time of the invention, it would have been obvious to one of ordinary skill in the art to incorporate, in Taub, a plurality of radially extending reinforcing ribs as a gripping receiver on a valve disk, as taught by Topham, so as to prevent the valve stem from deflecting horizontally with respect to the valve disk while maintaining a light weight and low operating temperature.

9. In regard to Claim 29, the embodiment of Figure 4 of Taub fails to specifically teach where the valve stem, valve disk, and valve cone are each separate components. However, in the embodiment of Figure 3, Taub teaches where the valve disk 52, valve cone 58, and valve stem 48 are each separate components thereby making the valve cone virtually free from forces acting on the valve disk during operation. Therefore, at the time of the invention, it would have been obvious to one ordinary skill in the art to form, in of any of the disclosed embodiments of Taub, the valve disk, valve cone, and valve stem out of separate components as a manner of design choice.

10. In regard to Claims 31 and 32, when making and or using the device of Taub, one necessarily performs the method of manufacturing a lightweight valve by producing a first component forming a valve disk 62 by forming or casting (page. 2, lines 26-28 and lines 57-60), producing a second component forming a valve stem 60, and producing a third component from a forming operation (stamping, page 2, lines 65-68) to create a valve cone 68. The valve disk 62 and valve stem 60 are connected by a positive material connection. The valve cone is pushed onto the valve stem and the valve cone is then connected to the valve stem and disk assembly by engaging a greater diameter end 70 of the valve cone in a recess defined by an edge step 64 which forms an edge region at 70 on the valve disk. Taub fails to teach where a gripping receiver is formed with the valve disk as one piece for receiving a valve stem and where the gripping

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receiver is formed by a plurality of reinforcing ribs with an end face forming a wall portion on the outer surface of the valve stem. Taub fails to further teach where the valve cone is welded to the valve disk and valve stem.

Topham teaches, in Figure 6, where a gripping receiver 7 is formed as one piece with a valve disk 14. The gripping receiver 7 is formed of a plurality of reinforcing ribs with an end face as per the rejection of Claim 16 above. The outer circumferential surface of the valve stem 6 is connected to the gripping receiver 7 of the valve disk by a non-positive connection.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to incorporate, in Taub, a valve disk formed as one piece with a gripping receiver, as taught by Topham, as per the rejection of Claim 16 above. In the embodiment of Figure 2, Taub teaches where the valve cone is permanently connected to the valve disk and valve stem. Because all of the components are metallic and that welded connections are notoriously known, one of ordinary skill in the art would recognize that any or all connections between the components are suitable for welding so as to increase the bond strength of the connections.

11. Claims 25, 26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taub in view of Topham as applied to Claims 16-24 above, and further in view of Cummings (2,439,240).

12. In regard to Claims 25 and 26, Taub teaches where a linearly rising first portion of the reinforcing ribs is adjoined by a second reinforcing rib portion, but fails to teach where the rib portions complement an inner wall of the hollow valve cone.

Cummings discloses a valve for internal combustion engines. Cummings teaches where the reinforcing ribs 18a extend from a radially external end S to the direction of the center of the

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valve disk 18c so as to complement the inner wall 18a of the hollow valve cone. In effect, the reinforcing ribs are the summation of numerous linearly rising reinforcing ribs that are each adjoined tangential to the inner surface of the valve cone. The reinforcing ribs 23a and 28 are provided with a cutout 28a, 28b and S in the area of the gripping receiver 23b, respectively, so as to reduce the size of the reinforcing end faces (col. 5, lines 4- 13).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to incorporate adjoined linearly rising reinforcing ribs with cutouts that complement an inner surface of valve cone, as taught by Cummings, so as to sufficiently support and connect a valve cone and valve disk and to allow coolant to fully occupy the created hollow space.

13. In regard to Claim 28, Taub fails to teach wherein the reinforcing ribs and the valve cone are interconnected by a material process. Cummings teaches where the valve cone 10b and ribs 13 are cast and forged together (col. 1, lines 40-52).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to connect a valve cone and reinforcing ribs together within an internal combustion valve, as taught by Cummings, so as to create a permanent heat conducting path between the two components.

14. Claims 27 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taub in view of Topham in view of Cummings as applied to Claim 25 above, taken with Blume (5,345,965).

In regard to Claims 27 and 35, Cummings teaches where the reinforcing ribs 18 bears against an inner wall 18a of the hollow valve cone 15b in sections 23b. In Figure 1, the ribs 13



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complement the inner wall of a valve cone 10b. However, Taub in view of Cummings fails to specifically teach where the reinforcing ribs possess an upper narrow side.

Blume discloses a composite valve body. In Figure 1, Blume teaches narrow reinforcing ribs 32 and annular reinforcing rib 35, each of which comprise varying thicknesses.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to incorporate, in Cummings, reinforcing ribs of varying thicknesses, as taught by Blume, so as to increase sectional stiffness of the valve body. Furthermore, it would have been obvious to change the profile of the bearing surface of the reinforcing ribs which mate with the inner surface of the valve one to any desired shape so as to effect a corresponding load distribution on the reinforcing ribs.

### ***Response to Arguments***

15. Applicant's arguments filed 02 December 2009 have been fully considered but they are not persuasive. Independent Claims 16, 31, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taub (1,727,621) in view of Topham et al. (5,044,604). Applicant asserts that, in Topham, radial reinforcing ribs 25 do not each include end faces forming a wall portion gripping an outer circumference of valve stem 6. Instead, sleeve 24 grips valve stem 6 and thus the reinforcing ribs 25 in Topham do not include "an end face facing a center of the valve disk center and forming a wall portion gripping an outer circumference of the valve stem" as recited in Claims 16 and 33 and is therefore not obvious over Taub in view of Topham (see REMARKS, page 8, para. 2). This is not found persuasive because the sleeve 24 in Figure 6 of Topham is in fact the summation of end wall portions of the reinforcing ribs 25. As best seen in the right half of the sectional view of Figure 6, the reinforcing rib at 7 necessarily possesses an end wall

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portion adjacent to the outer circumferential surface of the valve stem 7. This forms a gripping receiver for the valve stem since the end wall portions grip the valve stem via a notched portion 11 and tactile knurling 10 in Figure 2 which are non-positive connections. Similarly, when making and/or using the device of Taub in view of Topham, one necessarily performs the method Claim 31 (see REMARKS, page 9, para. 2). The claims have been rejected above so as to directly assess Applicant's claim amendments.

16. Applicant asserts that Taub in view of Topham does not teach where the valve cone is welded to both the valve stem and valve disk (see REMARKS, page 8, para. 2 and page. 9, para. 3). This is not found persuasive because Claims 16 and 33 are apparatus claims and therefore the recitation of welding is considered to be product by process subject matter. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See MPEP 2113 [R-1]. In regard to method Claim 31, Taub teaches, in the embodiment of Figure 2, where the valve cone is permanently connected to the valve disk and valve stem. Welding is notoriously known in the art as a suitable high strength method for permanently connecting metallic components together. Since the valve cone is permanently connected to the valve stem and valve disk in Figure 2, one of ordinary skill in the art would recognize that the valve cone is suitable for welding after being snapped into place upon assembly. Applicant further asserts that one of ordinary skill in the art could not have welded the plastic plug 7 of Topham with the metal valve cone of Taub (see REMARKS, page 8, para. 3 and page 10, para. 1). This argument is spurious because Taub is the primary reference and Topham is the secondary reference. As per the rejections above, it would

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have been obvious to weld the valve cone to the valve stem and valve disk of Taub with the addition of reinforcing ribs provided by Topham. In light of the rejections provided by Taub in view of Topham, the rejections of Claims 25-28 in view of Cummings (2,439,240) and Blume (5,345,965) are sustained.

***Conclusion***

17. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy S. Baskin whose telephone number is (571) 270-7421. The examiner can normally be reached on Monday through Friday, 7:30AM to 5:00PM ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on 571-272-4777. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. S. B./

Examiner, Art Unit 3753

/Robin O. Evans/

Supervisory Patent Examiner, Art Unit 3753